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ORIGINAL ARTICLE

Paracetamol for feverish children: parental motives and experiences

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Abstract

Objective. The sale of paracetamol products for children is increasing, and more children are accidentally given overdoses, even though the use of paracetamol against fever is still under discussion. This study explores Danish parents' use of paracetamol for feverish children and their motives for this use. **Design.** A cross-sectional survey using structured interviews. **Setting.** Four general practices located in city, suburb, and rural area. **Subjects.** A total of 100 Danish parents with at least one child under the age of 10 years. **Main outcome measures.** Number of parents administering paracetamol to feverish children, situations triggering medication of a child, parental views regarding fever and effects of paracetamol, and sources of information on fever treatment. **Results.** Three in four parents use paracetamol for feverish children, mainly to reduce temperature, to decrease pain, and to help the child fall asleep. Highly educated parents medicate more often than less educated. Parents often fear fever but this does not clearly affect their use of paracetamol. Many parents believe in perceived beneficial effects of paracetamol, such as increased appetite and well-being, better sleep, and prevention of fever seizures. These expectations of paracetamol influence parental use of the drug. Parents' main source of information on fever and paracetamol is their general practitioner (GP). **Conclusions.** Danish parents regularly treat feverish children with paracetamol. Although parents contact their GP for advice on fever treatment, paracetamol is sometimes given to children on vague indications. Clearer information for parents on when to give paracetamol as fever treatment may help regulate its use.

Key Words: *Antipyretic, children, family practice, fever, gender, paracetamol, parents, primary healthcare*

Fever is a common symptom in childhood and a frequent reason for parents to contact their general practitioner (GP) [1]. Antipyretics are widely used for treating feverish children [2–5]. In Denmark, the most common antipyretic substance for children is paracetamol. The sale of child-friendly paracetamol products, i.e. suppositories and mixtures, has increased 23% in the last five years (55.9–68.4 defined daily doses (DDD)/1,000 inhabitants/year) [5,6].

Paracetamol is considered a safe drug when taken in prescribed doses; however, overdosing may cause liver failure and death. Recent studies also show that intoxication in children happens after repeated doses only slightly above recommendations [7]. The number of Danish children (aged 0–11 years) hospitalized with paracetamol or acetylsalicylic acid (ASA) poisoning has increased from 23 in 1997 to 81 in 2006 [8].

The use of paracetamol against fever is still under discussion [9,10]. Fever involves discomfort; however,

the rise in body temperature is believed to assist the immune response against infection [11,12]. A minority of children experience fever seizures; these are often frightening to parents, but today if short-lasting they are considered benign [13]. Paracetamol has shown to be an effective analgesic and antipyretic; however, it is still unclear if the drug increases the well-being, the sleep, or the appetite of a feverish child [14–16]. Paracetamol has not yet proved effective in preventing fever seizures [13,17,18]. Conversely, no studies have documented a positive effect of not giving paracetamol to feverish children. NICE guidelines recommend use of paracetamol mainly in cases of fever and discomfort or pain [19].

Internationally, numerous parents regularly give paracetamol against fever [2,3,20]. The most frequent reason for giving the drug to a feverish child is simply to lower the temperature. Some parents believe that paracetamol relieves their children of

The sale of child-friendly paracetamol products is increasing in Denmark, even though use of paracetamol as treatment of fever is still being debated.

- Parents give paracetamol to improve well-being, appetite, and sleep of feverish children – research only vaguely supports this use.
- Highly educated parents medicate more often than less educated.
- Danish parents' main source of information concerning fever and its treatment is their general practitioner.

discomfort, and gives them more appetite and energy. [3,20,21]. Additionally, paracetamol may be a way of coping with a sick child in a busy daily life [20].

Some parents fear that fever might harm their child by causing seizures, brain damage, and even death, if the temperature is high or rapidly rising. This unrealistic fear, termed fever phobia, may be linked to the wide use of antipyretics among parents [22–24]. For some parents fever is considered the disease in itself, and paracetamol is believed to cure the child [20].

This study aimed at exploring:

1. to what extent and in which situations parents give their children antipyretics;
2. if parental views of the effects of paracetamol are consistent with existing evidence, and if their views influence the use of the drug;
3. if fever phobia is present among parents and if it motivates them to give paracetamol;
4. where parents seek information on handling a feverish child.

Material and methods

This study was carried out as a cross-sectional interview survey.

Population

Danish parents with at least one child under the age of 10 years, recruited in four general practices during April and May 2008. Parents who did not understand Danish were excluded.

Interview guide

A structured interview guide was developed from international surveys [3,24,25]. A test version was

tried out on 15 parents, who commented on the interview. All pilot interviews were audiotaped and the interview guide was continuously revised until clarity and simplicity of each item was obtained.

The interview guide contained an introduction and 47 items. Twelve items collected background information of the parents (e.g. age, number and age of children, education and experience with a sick child). Thirteen items covered the use of paracetamol, seven items asked about fever phobia, and another seven about the parents' expectations of paracetamol's effects. Eight items addressed the parents' sources of information on childhood fever.

The interviews

The interviews were conducted by JFJ and LLT in four general practices: one located in the centre of Copenhagen, one in a Copenhagen suburb, and two in a rural area. These practices were selected because of diversity in location, and because the authors had personal connections with the general practitioners. The interviewers stayed in the waiting rooms and asked all eligible parents who appeared with or without children to participate. Interviews were carried out in the waiting room or an examination room, and took approximately 15 minutes. The interviewers read aloud the interview guide in a neutral tone, and the participants replied to one item before moving on to the next. In items with several response options the parents were shown cards including all possible answers. Furthermore, they were presented with pictures of all available antipyretics for recognition.

Statistics

Differences in characteristics of the parents between practice locations were assessed by chi-squared tests and Kruskal–Wallis tests. Fever phobia was defined as partly or fully agreeing with one or more of the items concerning harmful effects of fever (see Table IIIA, items labelled with *). Associations between views regarding fever phobia and expectations of paracetamol and whether the parents had ever given paracetamol to a child, and associations between education and information sources were assessed with chi-squared tests. In the former, the original five-category Likert scale was transformed into a three-point scale prior to the analyses. Associations between having given paracetamol to a feverish child and six social variables were assessed in logistic regression analyses, both unadjusted and adjusted for the other five variables.

Ethical considerations

According to Danish rules interview surveys do not need approval by the Ethics Committee and all participants remained anonymous. No personal data were collected except for gender, age, and number of children.

Results

In total 104 parents were asked to participate and 100 accepted. Reasons for not participating were lack of time, a sick child, and unwillingness. Parents in the city and suburb had a higher education and fewer children compared with parents in the rural area (Table I).

Of the 100 parents 75 had ever given antipyretics to their feverish child. During the last three months 61 parents had administered antipyretics to one or more of their children; 58 parents gave paracetamol only, two gave paracetamol and ibuprofen, and one gave paracetamol and ASA. In 66% of cases the drug was given to reduce fever, while 54% of the children received the drug against pain. The decision to give the child paracetamol was made by the mother in 49 cases and by both parents in 47 cases. Only four parents replied that the father decided whether to medicate or not.

The situations where most parents would give paracetamol were if the fever was high, or if the child experienced pain or needed to sleep (Table II). However, 18 parents reported never administering paracetamol to a child before consulting a doctor, irrespective of symptoms.

The parents' views on the role of fever in children are presented in Table IIIA. In total, 85 parents met

the definition of fever phobia. Three in four parents believed that a very high fever can be harmful to a child, and a larger proportion of these parents had given paracetamol to their feverish child compared with parents not perceiving fever as harmful, 79% and 46% respectively, $p = 0.036$. For the remaining items regarding fever phobia there was no significant association between fear of fever and use of paracetamol (Table IIIA).

Parental views of paracetamol were that their feverish child felt better, became more alert, and slept easier after taking paracetamol. However, the majority of the parents disagreed that paracetamol results in a faster recovery. Significantly more parents convinced of perceived beneficial effects of paracetamol had ever given the antipyretic to a feverish child, compared with parents of the opposite opinion (Table IIIB).

Highly educated parents and parents who used paracetamol themselves against fever gave paracetamol more often than parents with less education and non-users of paracetamol (Table IV). The GP was the most common source of information on how to treat fever. In total 92% contacted their GP for advice when their child had a fever. Highly educated parents found information in books (74% vs. 42%, $p = 0.001$) and on the internet (74% vs. 47%, $p = 0.005$) more often than less educated parents who instead asked their own parents for advice (62% vs. 43%, $p = 0.049$).

Discussion

This study shows that in Denmark parents often use paracetamol to treat feverish children. The drug is

Table I. Characteristics of the 100 interviewed parents stratified on practice location.

| Parents | Total (n = 100) | City (n = 45) | Suburb (n = 19) | Rural area (n = 36) | p-value ¹ |
|--|-----------------|---------------|-----------------|---------------------|----------------------|
| Age, years; average (min-max) | 33.5 (18-55) | 34.2 (22-55) | 33.2 (27-49) | 32.8 | 0.979 |
| Mothers, n (%) | 82 (82.0) | 34 (75.6) | 17 (89.5) | 31 (86.1) | 0.302 |
| Fathers, n (%) | 18 (18.0) | 11 (24.4) | 2 (10.5) | 5 (13.9) | |
| Single parent, n (%) | 14 (14.0) | 4 (8.9) | 2 (10.5) | 8 (22.2) | 0.203 |
| With partner, n (%) | 86 (86.0) | 41 (91.1) | 17 (89.5) | 28 (77.8) | |
| Number of children, average(min-max) | 2.2 (1-8) | 1.7 (1-4) | 2.1 (1-3) | 2.8 (1-8) | 0.008 |
| Highly educated, ² n (%) | 47 (47.0) | 32 (71.1) | 9 (47.4) | 6 (16.7) | 0.000 |
| Less educated, ² n (%) | 53 (53.0) | 13 (28.9) | 10 (52.6) | 30 (83.3) | |
| Has experienced fever seizure, n (%) | 14 (14.0) | 3 (6.7) | 3 (15.8) | 8 (22.2) | 0.130 |
| Has experienced an acutely ill child, ³ n (%) | 18 (18.0) | 9 (20.0) | 0 (0.0) | 9 (25.0) | 0.064 |
| Has a chronically ill child, ⁴ n (%) | 19 (19.0) | 6 (13.3) | 2 (10.5) | 11 (30.6) | 0.084 |
| Uses antipyretics themselves, n (%) | 59 (59.0) | 30 (66.7) | 10 (52.6) | 19 (52.8) | 0.370 |

Notes: ¹Differences between the locations are assessed by chi-squared tests or Kruskal-Wallis tests.

²Parents were divided into two groups of education: highly educated parents had a university degree (bachelor or higher) or were studying for such – the remainder of the parents were defined as less educated.

³An acutely ill child was defined as a child who at any time had experienced a potentially life-threatening acute illness.

⁴A chronically ill child was defined as a child who received medications for his/her condition at least three months within a year.

Table II. Parents' responses (out of 100 respondents) to the question: "Would you give your child paracetamol in the following situations, before contacting a doctor?"

| | Medication when fever reaches... | | | No medication |
|--|----------------------------------|------|------|---------------|
| | 38°C | 39°C | 40°C | |
| The child has a fever | 6 | 30 | 37 | 50 |
| The child has a fever, is drowsy, and you are unable to uphold contact | 19 | 32 | 32 | 60 |
| The child has a fever and doesn't eat and drink | 20 | 31 | 32 | 59 |
| The child has a fever and needs to sleep | 26 | 41 | 40 | 48 |
| The child has a fever, feels pain | 72 | 69 | 57 | 23 |
| The child has a fever, and needs to attend kindergarten | 3 | 1 | 0 | 95 |
| The child has a fever and needs to attend a family arrangement | 12 | 7 | 2 | 87 |

more frequently used by highly educated parents compared with less educated, and it is most common to medicate to reduce a high temperature, to decrease

pain, to increase appetite, and to help the child fall asleep. More than 90% of parents contact their doctor for advice about feverish children; however, their

Table III. Distribution of views (agrees, neutral, and disagrees) on 14 statements regarding fever phobia and effects of paracetamol in feverish children, and percentage of parents within each view group who have given paracetamol to a child at any time.

| | Agrees (partly/fully) | | Neutral ² | | Disagrees (partly/fully) | | |
|--|-----------------------|---|----------------------|---|--------------------------|---|----------------------|
| | | % of these who have given paracetamol | | % of these who have given paracetamol | | % of these who have given paracetamol | p-value ¹ |
| | n | | n | | n | | |
| A: | | | | | | | |
| Fever is the body's reaction to an illness | 91 | 73.6 | 5 | 80.0 | 4 | 100.0 | 0.474 |
| A very high fever may harm ³ children, and should be reduced* | 77 | 79.2 | 10 | 80.0 | 13 | 46.2 | 0.036 |
| A very high fever may cause boiling of the child, and should be reduced* | 58 | 74.1 | 16 | 81.3 | 26 | 73.1 | 0.816 |
| A very high fever may cause brain damage in children, and should be reduced* | 34 | 76.5 | 35 | 77.1 | 31 | 71.0 | 0.821 |
| A very high fever may worsen the illness of the child* | 24 | 70.8 | 25 | 84.0 | 51 | 72.5 | 0.481 |
| A child can more easily fight a disease without the fever | 21 | 71.4 | 27 | 74.1 | 52 | 76.9 | 0.879 |
| Fever helps in fighting the disease, and should NOT be reduced | 47 | 76.6 | 16 | 75.0 | 37 | 73.0 | 0.930 |
| B: | | | | | | | |
| When a child has a fever and receives paracetamol the child has a faster recovery | 16 | 87.5 | 10 | 80.0 | 74 | 71.6 | 0.383 |
| ... the child feels better | 89 | 73.0 | 4 | 100.0 | 7 | 85.7 | 0.378 |
| ... the child has more appetite | 45 | 86.7 | 27 | 70.4 | 28 | 60.7 | 0.036 |
| ... the child is more eager to drink | 41 | 78.0 | 34 | 76.5 | 25 | 68.0 | 0.639 |
| ... the child is more alert | 78 | 79.5 | 9 | 44.4 | 13 | 62.2 | 0.062 |
| ... the child sleeps easier | 86 | 77.9 | 8 | 75.5 | 6 | 33.3 | 0.051 |
| ... the medication prevents fever seizures | 41 | 87.8 | 46 | 67.4 | 13 | 61.5 | 0.044 |

Notes: Parents agreeing with one or more of the items labelled with * were defined as fever phobic (n = 85).

¹These relationships are assessed with a chi-squared test of which the p-value is listed.

²The neutral group includes all parents responding "Do not know" and "Neither agrees, nor disagrees".

³Harm is defined as danger associated specifically with the rise in temperature.

Table IV. Logistic regression on whether the parents have given paracetamol to a child at any time. Reported are unadjusted and adjusted odds ratios (OR), with 95% confidence intervals (CI), of six selected social variables. The reference group for the OR estimate is the underlined category.

| | Unadjusted | | Adjusted ¹ | |
|---|------------|---------|-----------------------|----------|
| | OR | 95% CI | OR | 95% CI |
| Education, (High/ <u>Low</u>) | 2.30 | 0.9–6.0 | 4.42 | 1.4–14.3 |
| Experience with an acutely ill child ² , (Yes/ <u>No</u>) | 1.14 | 0.4–3.1 | 0.59 | 0.2–1.9 |
| Experience with a chronically ill child, (Yes/ <u>No</u>) | 1.31 | 0.4–4.4 | 1.23 | 0.3–4.8 |
| More than one child (Yes/ <u>No</u>) | 1.61 | 0.6–4.1 | 0.88 | 0.3–2.7 |
| Location (Rural area/ <u>City or suburb</u>) | 1.62 | 0.6–4.4 | 4.46 | 1.2–16.9 |
| Parent takes antipyretics him/herself (Yes/ <u>No</u>) | 3.56 | 1.4–9.2 | 4.77 | 1.6–14.4 |

¹The OR is adjusted for all other social variables in this table.

²An acutely ill child includes a child with fever seizures, or who has been admitted to a hospital with an acute illness.

ideas about fever and paracetamol resemble those found in international studies [3,20,23,24]. Some parents fear that fever may harm their child, by causing boiling or brain damage. The majority believe that paracetamol improves the well-being of a feverish child. It is interesting that while paracetamol is widely used for feverish children in Denmark, and the general opinion among parents is that the drug greatly benefits their child, research does not yet fully support this use. This discrepancy may be due to insufficient research, as to our knowledge only two placebo-controlled studies exist investigating the well-being of feverish children [14,16].

Our material may not entirely represent the population of Denmark, because our data were collected in general practices, and some parents see their GP more often than others for advice. However, because of the Danish child examination programme, all children (and their parents) see a GP regularly in their first years.

Our findings regarding parental use of paracetamol for feverish children are consistent with international studies [2]. Giving ibuprofen and alternating between drugs when treating fever is not yet common in Denmark [3,4]. Fever phobia seems to be present among parents in Denmark. However, in creating our interview guide we found it difficult to distinguish between fever phobia and the reasonable concern that a child is seriously ill. This problem in defining and delimiting fever phobia has not yet been addressed, and may have influenced our results. Surprisingly, we did not find a clear association between fever phobia and use of paracetamol. Parents who fear fever might react by contacting their doctor for reassurance instead of giving paracetamol [26]. Thus, the information given by the GP seems important.

In our study, parents' own use of paracetamol was correlated with giving the drug to their child. This finding is consistent with a previous study regarding prescription drugs for young children and their mothers [27]. It may also be related to gender aspects

on medicating, as the majority of our respondents were women. Women have been shown to medicate more often than men [28], and this could influence the inclination to give their child medicine as well [29]. However, for half of the women the decision to give their child paracetamol was made in agreement with their partner. Our results may indicate that parents' medicating habits to some extent pass on to their children. This is, however, speculative.

The increasing use of paracetamol for children may have numerous explanations. An obvious cause is easier access to over-the-counter drugs and public advertising. The current view among parents that paracetamol improves the well-being of feverish children may also motivate them to give the drug. Moreover, the attitude towards illness in general seems to be changing in Western societies. Illness is often considered an inconvenience in our daily lives [30], and there is not always room for feverish children. Reducing the fever with paracetamol may lessen the burden of a sick child. Perhaps highly educated parents with long working hours have more difficulty prioritizing a sick child.

This study does not give exact figures of paracetamol use in children and it cannot tell if children in Denmark receive too much paracetamol. However, our results show that paracetamol is sometimes given on vague indications, i.e. to reduce fever when a child is otherwise well, or to improve the child's appetite and sleep or prevent fever seizures, even though evidence of these effects is still unclear. Thus, the NICE recommendations [19], to give paracetamol only in case of pain or discomfort, are disregarded, or unknown to many parents in Denmark. In some cases paracetamol may work mainly by relieving parents of their worries.

Furthermore, this study suggests that information given by GPs influences parents' paracetamol use. Some Danish GPs may also need an update on recommendations regarding use of paracetamol, to give parents appropriate advice. The current knowledge

among GPs regarding childhood fevers and their treatment is worth exploring in future studies.

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